

Needed Materials Per Group: 1 - clipboard, 4 - golf tees, 3 - large trash bags, 30 - plastic grocery bags, 2 - tongs, 6 pair - plastic gloves, 1 - balance, 1 - newspaper or 8 - large sheets of white paper.

Safety Rule: It is recommended that students wear gloves to pick up the trash found in their 10 square meter plot. Do not pick up hypodermic needles or syringes, if found, report them to your teacher and then record them on your tally sheet.

## **Procedure:**

Student Information: The following information will provide you with the steps for setting up your investigation of schoolyard litter. It is important to hold all of the variables constant except for those that are being manipulated. Constant (or controlled variables) would be such things as: the size of the plot, the chosen day of collection, the weather, the amount of time the experiment is conducted, etc. In this case the manipulated (or independent) variable would be the thing that we change to see if the response will be different - plot location. The responding (or dependent) variable for this experiment will be number and types of litter collected from each plot. NOTE: Weather is one variable that will be difficult to control in this experiment. However, from your experiments, you may be able to infer if the weather has an impact on the number and types of litter collected.

### **Steps for Conducting the Investigation**

- 1. Click on the “View Data” link at the Schoolyard Litter Investigation web page. Click on “View” in the blank sample listed on the chart. What comes up is the data collection sheet that will be used in this investigation. Print it and place it on your clipboard.
- 2. Each student group will be assigned a location around the school comparable to those in the dropdown list on the data collection sheet (sidewalk area, parking lot area, school entrance area, ditch area, fence area, playground area). Try to choose locations that appear to have litter dropped daily. If you opt for another area other than those just listed be sure to describe it in “Comments” when you enter your data online.
- 3. Once you have chosen the locations use golf tees to mark a 10 square meter plot in the area you were assigned. NOTE: This size was chosen to allow you to have a 2 X 5 meter rectangle along some heavily littered area.
- 4. Please push the tees deep into the soil at each corner of your plot so that only their tops are exposed. This area will be used to collect the schoolyard litter. If you are using a GPS to relocate your plot later, be sure to acquire and name a

Waypoint for a corner of each plot at this time. It would also be wise to locate a corner in another fashion in case the tees are lost or taken.

- 5. Write down your group's name and the plot location you were given to make your collections. Write the name of this location on the large plastic bags. Use one bag for each of your three collection days.
- 6. Collect all of the litter from your plot on day 1. Safety Alert: Please cover your hands with plastic gloves and/or use tongs to collect the waste. Do not pick up needles or syringes. If found, just record them on your tally sheet and then report them to your teacher.
- 5. After a 7-day period of time, return to your location and collect the litter from your marked 10 square meter plot a second time. Repeat the above process one more time after seven more days.
- 6. Take your collection bag of litter back to your classroom. Cover a table with large sheets of white paper or newspapers. NOTE: This can also be done on the floor if there are no tables available. Using plastic gloves or tongs, carefully remove the collected litter from your plastic bag. Sort the litter into its various groups as described on the data collection sheet downloaded and printed from the Schoolyard Litter web page. Keep the litter from each location separate.
- 7. Using the data collection sheet, record the numbers of each type of litter.
- 8. After recording the numbers, place each type of litter from your location in a bag for weighing. Weighing helps you to work out the exact proportion of the different types of materials more accurately than just recording the numbers of each. Be sure that your weight measurements are metric (grams).
- 9. Repeat steps 4 through 7 above once every week for three weeks.
- 10. Complete the data collection sheet and display your results. NOTE: You may choose to complete a data collection sheet for your plot each week, or take an average over the three-week period and report the results on one data collection sheet. If you choose to average your data, be sure to state that it is a 3-week average on your collection form.
- 11. After group and classroom discussions have occurred, login to enter your data online at the correct location. NOTE: Only numbers must be inserted into the spaces provided in order for your Excel spreadsheet to work properly.
- 12. Once all classroom data is submitted you can download **all** submitted Schoolyard Litter data and develop charts and graphs in Excel by following the general directions provided at "[Downloading and Analyzing Collected Data Using an Excel Spreadsheet](#)"